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April 3, 2002

Secretary
Federal Communications Commission
Washington, DC 20554

Re: ET Docket No. 01-75, Broadcast Auxiliary Service

Gentlemen:

On behalf of Microwave Radio Communications, I have attached answers to the questions that we received from Ted Ryder on March 25.

Sincerely,

Jeffrey Krauss

Additional Comments of Microwave Radio Communications in ET Docket No. 01-75

Question 1:

Does the composite dual carrier digital/FM emissions of the TwinStream meet the existing Section 74.637(a) FM mask? Does the dual carrier TwinStream*'s digital emission meet the Section 101.111(a)(2)(i) digital mask, or the Section 74.637(a) or (c)(1) FM mask, or the Section 74.637(b) mask; does its analog emission meet the existing Section 74.637(a) FM mask, or the Section 74.637(c)(1) FM mask proposed to apply below 15 GHz? (Please refer to page 6 of your Comments)*

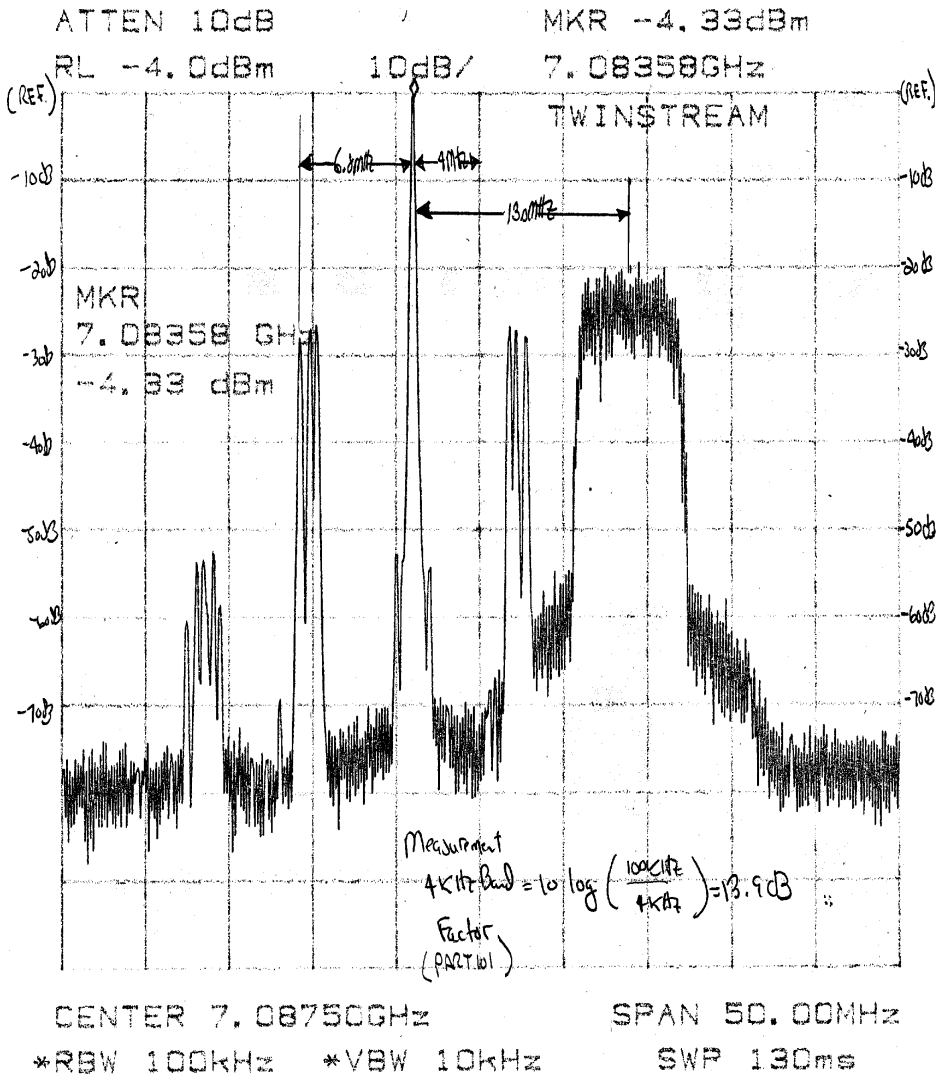
Yes, to all of the above, see the spectrum masks below for full details. For the dual carrier emission, the TwinStream meets a composite emission mask based on the analog mask parameters on the side of the channel where the analog signal is located, and the digital mask parameters on the side where the digital signal is located. For the digital emission, the digital mask is based on a bandwidth of 7 MHz; and for the analog emission, the analog mask is based on a bandwidth of 17 MHz.

Question 2:

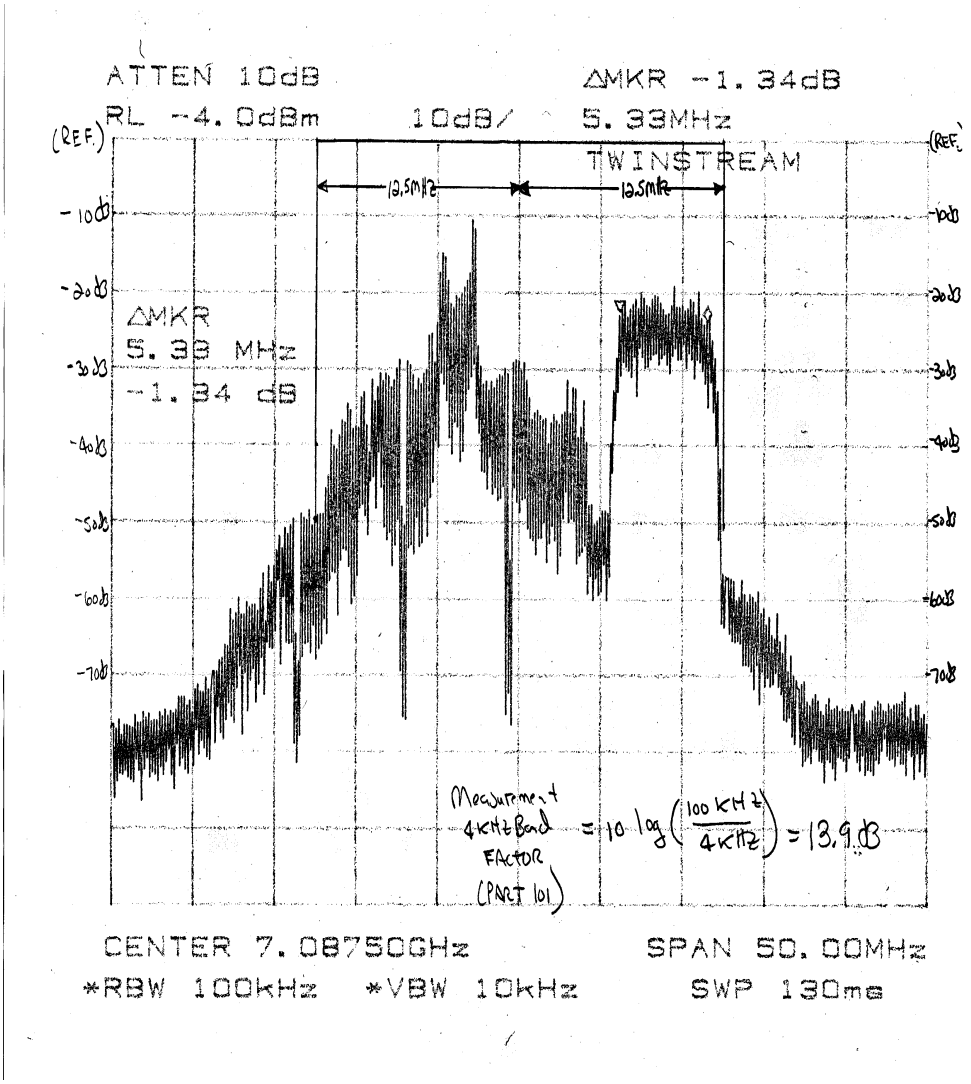
Please provide any available power spectra for dual carrier TwinStream operation, particularly any spectra demonstrating compliance with existing emission masks.*

The following two spectrums are a spectral output plot of a TwinStream radio with the FM carrier unmodulated and then modulated. The ATSC 16 QAM digital pedestal is also shown for each plot.

Twinstream Plot #1



Twinstream Plot #2



Question 3:

For the dual carrier TwinStream, what are the mean power and necessary bandwidth of the composite digital/analog emission? For each of the digital and FM carriers, what is the mean power, necessary bandwidth, three-character emission type, and frequency offset from center of the channel?*

The TwinStream radio transmits two main offset carriers, one for the digital 19 Mbit/sec ATSC signal and one to support the legacy analog FM video. In conjunction with the FM carrier, the radio transmits three or four audio subcarriers to support 15 KHz voice requirements dependendent on the broadcaster's needs. The audio subcarriers have an injection level of –26 dB down from the main carrier and are part of the composite analog bandwidth since functionally they operate together.

The following chart shows the requirements for a 7 GHz standard radio.

Carrier	**Power**	**Bandwidth**	**Emission Type**	**Freq. Offset**
Digital	+27 dbm	7 MHz	D7W – 16 QAM	+9.0 MHz
Analog	+33 dbm	17 MHz	F8W – FM Video	-4.0 MHz

Question 4:

When the dual carrier TwinStream radio is operated with a single carrier, is the carrier in the center of the channel, or offset? If in the center, does the emission occupy the entire channel?*

When the dual carrier TwinStream is operated with a single analog carrier , the carrier is placed 4 MHz from center. This is the same location as is when it has a digital carrier present. The significance of this is that it allows the customer to upgrade to digital easier without disturbing his legacy video carrier. A customer with only a digital signal to transmit would use a single carrier digital radio, not the TwinStream.

Question 5:

Does your proposal to apply an FM emission mask to ENG radios that support digital and analog operation individually, e.g., via switch selection, refer to the existing Section 74.637(a) FM mask or to the Section 74.637(c)(1) FM mask proposed to apply below 15 GHz? (Please refer to pages 6 and 7 of your Comments)

Section 74.637(a) should apply.

Question 6:

Does your opposition to the digital emission mask for COFDM concern only ENG COFDM systems, or would it extend to fixed systems or to other digital modulations? Which FM emission mask, i.e., the existing Section 74.637(a) mask or the proposed Section 74.637(c)(1) mask, do you believe would be appropriate for such systems below 15 GHz? (Please refer to pages 6 and 7 of your Comments, and to page 2 of your Reply Comments)

It would only pertain to transitional ENG COFDM systems where the user has the flexibility to switch between analog modulation and digital COFDM techniques when required. At some point in the future, when the transition has ended and the digital ENG microwave technology has matured, a more stringent emission mask might be appropriate.

The existing mask of section 74.637(a) should apply.

Question 7:

Please detail how and to what extent the imposition of the Section 101.111(a)(2)(i) digital emission mask for BAS transmitters below 15 GHz would decrease system gain in COFDM systems, cause broadcasters duplication of their coverage area, and be a barrier to an evolution to narrower channels. Do your comments apply only to COFDM, or would all digital modulation be affected? (Please refer to pages 6 and 7 of your Comments, and to page 2 of your Reply Comments)

Section 101.111(a)(2)(i) is a more stringent channel mask and thus requires a higher degree of linearity from the microwave transmitter to support COFDM systems. The increase in linearity requires more power backoff. It will decrease the user's available output power and thus decrease overall user system coverage.

For portable ENG operation, the emission mask does not play as strong a role as in a fixed microwave link environment for mitigating interference. Portable ENG operators will use antenna polarity, channel frequency offsets, IF filter selection and local frequency co-ordinators to minimize adjacent channel performance.

This flexibility is even more important with split channel operation, as broadcasters transition from 17 MHz to 12 MHz bandwidth. COFDM radios will need to occupy bandwidths as low as 6 MHz so that two independent 6 MHz channels can operate in a 12 MHz channel.

This flexibility is also needed for single-carrier digital transmitters, because of the dual transition from analog to digital video and from 17 MHz to 12 MHz bandwidths. Radios that can accommodate broadcasters' needs during this transition may need to operate in

either analog or digital mode, and at varying bandwidths, whether they are COFDM or single-carrier radios.

Question 8:

Please provide us any available power spectra for your COFDM radios, particularly any spectra demonstrating compliance with existing emission masks, as well as their mean powers and necessary bandwidths.

The following plot shows a typical output plot of our radio using COFDM techniques with a 8 MHz digital pedestal. The COFDM application allows the user to tradeoff data thruput or bit rate versus DENG path requirements (multipath, C/N) and Tx power output. The following chart shows some of the typical data thru put that are used versus power output and bandwidth. Bandwidths of 7 MHz and 6 MHz are also supported.

Mode	***Bit Rate***	***TX Power Output***	***COFDM Pedestal***
QPSK – ½	5.53 Mbits	34 - 38 dbm	8 MHz
16 QAM – ½	11.06 Mbits	33 - 36 dbm	8 MHz

COFDM Radio Spectral Plot